

**ABSTRACT OF THE INVENTION**

The present invention makes it possible to detect cellular activity in a sensitive and efficient manner without the use of labels and without knowing specifically what activity is being detected, although detection of specific activity is possible. The assay comprises detecting cellular activity by monitoring a change in a cellular system, comprising coupling an electromagnetic test signal in a specified frequency range to a sample in which a cellular event is being detected, whereby the sample interacts with and modulates the test signal to produce a modulated test signal; detecting the modulated test signal; and analyzing the modulated test signal to detect said cellular event. As such, the present invention is particularly useful in the detection of cellular activity induced by the presence of a test substance in the medium in which a cell is located and provides a number of advantages for lead optimization in the drug discovery field.